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Discussion

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DISCUSSION FOLLOWING THE REMARKS OF DAVID CRANE AND KENT T. HUGHES

DR. KING: Well, I just want to start with a few questions, one question anyway. I want to get the audience to participate. Talking about innovation as it was commented on to me by Albert Speer who I knew from Nuremberg, he was concerned about the tremendous defects of innovation in the negative sense.

And in other words, he thought that by devising military or other instruments that mankind might destroy itself, and he hoped that Nuremberg would be a means of mankind relating to one another in the future because he saw possible bad effects of innovation.

Now, what I am concerned about is controls over innovation, whether you think that the marketplace should be the sole determinate of whether the innovation is good or bad. I am assuming that not all innovations are good for the public, but perhaps, Dave, or both of you have some comments on that.

MR. CRANE: Well, Martin Reece, who is a royal astronomer in Britain, wrote a book last year, a best seller called "How the World Will End."

DR. KING: Yeah. That's what Speer was talking about.

MR. CRANE: And his argument was that there was only a 50-percent probability that human beings would survive the 21st century.

DR. KING: Right.

MR. CRANE: I don't know enough about science to know whether he is being pessimistic or optimistic, but there is no doubt that in the end it is the role of Government, I think, and society to set the standards on what can and cannot be done.

I mean, we do that already or attempt to do it on access to nuclear knowledge. We have controls over access to certain types of chemicals, and we do it even in a small way. I mean, if you are a farmer and you want to apply a new pesticide or new herbicide on your farm, at least in Canada, you have to take a training course and get a certificate showing you know how to properly use these things.

Otherwise, we are in danger of destroying watersheds and polluting the water and doing a lot of bad things, and we do that with controls to try to prevent E-coli disease on dairy farms and a whole range of areas we do that, so that I think we expect our public agencies, concern for public health and security to have the final say.

The difficulty we have is to make sure that these entities are fully independent from political pressure, and secondly, that they have the funding and capabilities to make sound judgments. One of the dangers in our political systems is that lobbyists can influence the political process to prevent proper standards from being applied.

We know, for example, that too much sugar is very bad for people in terms of potential for diabetes. Yet, through a very strong lobbying campaign by the sugar industry there was a significant effort, unfortunately from the United States, to try to prevent the World Health Organization and its description for a safe diet from having a lower level of sugar consumption because the sugar producers didn't want to do that.

So it is very important to have the integrity of these institutions. And you saw it in another field, in the Securities and Exchange Commission when it was trying to deal with certain accounting issues. And the threats from Congress as a result of lobby and campaign donations to significantly reduce the budget of the SEC if it went ahead with reforms, which in hindsight we now have because they were the right reforms, but the political power to interfere with the integrity of institutions is a big challenge.

DR. KING: Do you have any comments?

MR. HUGHES: I have two: A narrow comment in the sense that I think we are ever more aware of the unintended consequences of technology. The Wilson Center has a major grant from the Pew Foundation to look at the ethical, safety, and policy implications of nanotechnology. Quite a number of products are already on the market, and as we saw with genetically modified organisms, if you are not cautious or persuasive, you could have quite a popular backlash.

In a broader sense, it is a very good question because we should not only talk about innovation or technology in the laboratory sense or the gee-whiz sense. The innovation system has to be rooted in the values and institutions of a country. We need to think about the social consequences; the income distribution consequences of rapid technical change.

DR. KING: Okay. Let's throw it open to questions. I can continue with my interrogation.

Yeah, Mr. Barber, we are happy to have you here today.

MR. BARBER: Thank you. My question in some way has already been addressed, and that is that there isn't any guarantee that innovation is going to be innovation for good purposes. It can be equally innovation for bad purposes.

You know, 9/11 is an example of an innovation where people saw the potential for a fully-fueled aircraft to be a very destructive element. So the real question is: What do we do about the human condition? It is one thing to have all the technological capacity, but how it gets employed constructively or destructively is about how we are as humans.

You might say another one of the destructive ones that I worry about is the one about the guaranteed pension schemes, at least in Canada, where in the universities, as I see it, we are probably not going to be able to afford the young faculty to teach our next generation in the next 15 or 20 years because most of the operating funds of the universities are going to be going into the

people that are retired with indexed beautiful pensions, the real Rolls Royce ones.

So you have a kind of economic disparity that actually may be quite a suppressant on our ability to innovate in the next fifty years.

DR. KING: Do you have comments on that?

MR. HUGHES: The Social Security debate in the United States is important but the real question is healthcare and Medicare. Looking ahead, specialists say that people project that in the not too distant future the entire federal budget could be devoted to public spending on health given current programs and no changes in policy.

If that happened, would that squeeze out funding on basic science, on technology, on medical research and so forth? It raises a question of politics and national leadership. We have to, at some point, say we have serious national challenges – more than Canada and less than Europe – that we need to think about. Technology may play a role, but also values and institutional innovations.

DR. KING: David, do you have a comment?

MR. CRANE: Yeah. You are talking about the over 50s versus the under 30s again, and that's a serious issue. You can also criticize –

DR. KING: Can you hear, David, upstairs?

MR. CRANE: – criticize universities for the way in which they see their accounting over many years to sort of hide the implications for these future commitments, and now they are coming as a bit of a shock, but there is a broader issue. I heard a number of years at a conference and somebody asked Lester Thoreau at a conference what is the role of Government, and he said the role of Government is to represent the future to the present.

And I think that is the biggest single failing of our political leadership today. They are unwilling to ask people to make sacrifices. They are unwilling to be frank with the public, with the real issues we face. We do not have institutions and individuals in our political process I do not think that can take this future-looking holistic kind of view of where we are headed, and you got the Newt Gingrich revolution in the United States, which abolished that office? What was it called?

MR. HUGHES: Office of Technology Assessment.

MR. CRANE: Assessment, which did a lot of things within the U.S. Congress trying to look down the road. The IMF has some people who are doing a lot of work saying the Government should publish forward looking documents that show the fiscal implications of all their programs for the next 10 or 15 years so we could get a better understanding of what they have to address.

Now, one Government actually does this that I know of and that's the British. Since [Tony] Blair came in, the British treasury publishes not every

year, but I think every second or third-year, a forward looking fiscal framework that goes at least ten years into the future, perhaps fifteen.

So people can see what is the cost of these programs going to be? What is our fiscal situation? Where is our flexibility?

Now, on the issue of healthcare, the one reservation I have is that when we extrapolate these costs into the future, we are extrapolating them on the basis of existing technology and existing practices. So you have to inject into that, what would happen if – this is a small example – but if all health records were electronically filed, that would improve the efficiency. What would happen if we got really serious about kids' diets in school and the obesity risk? What would that mean?

And in other words, we looked at a whole range of things that affects health because the healthcare system is like the automobile repair shop. It is dealing with things when they go wrong, whereas what we have to deal with is health, what makes for good health.

And we have had research in Canada, advanced research on why are some societies healthier than others, and they have a lot to do with behavior, with the social environment, and matters of this sort. And I think we have to look much more intelligently at those kinds of issues.

Again, you have got to fight your way through the lobbyists and the vested interests who have a particular interest in not changing the system and who put a lot of money into political parties and do these kinds of things and hire a lot of, if I can say so, Henry, lawyers to try to prevent change.

And so that I am not as pessimistic on healthcare if we do intelligent things because I look back over the last 50 years and look at the success we have had in dealing with certain things. If a man in his 50s had a heart attack 30 years ago, would he go back to work? What were his chances of survival?

Look today at not only the decline and mortality of females from heart attacks versus 30 years ago, look also at the capacity of people to return to work after they have had a heart attack versus 30 years ago. There are a lot of things we can do, and I think when we are thinking about healthcare, we have to think about all the ways we can address this. How do we do things to reduce the need for people to go through expensive care systems?

DR. KING: Okay. Other questions? John Groetzinger.

MR. GROETZINGER: For many years, innovation happened in very large corporations, whether it was IBM developing computer chips –

DR. KING: Can everybody hear John?

MR. GROETZINGER: Sorry, I have a little cold – or as Kent mentioned Bell Labs, you know, very mammoth organizations doing sort of neat stuff. We have witnessed really since the late '90s to the present the breakdown of large entities, whether it is conglomerates spinning off subsidiaries, but innovation now seems to be happening in smaller entities, smaller units, and I

wondered if you agree with that trend, but more what should Government do to encourage innovation?

Does innovation happen best on a small unit basis or within a large organization?

DR. KING: Do you want to tackle that, Kent?

MR. HUGHES: Let me take those two questions separately.

MR. GROETZINGER: Yeah.

MR. HUGHES: There is no question that since the rise of Japan, corporate North America shifted its research focus to development. So there was increased spending, but it became more targeted to commercialization.

While U.S. corporations became more successful at rapidly commercializing, they decided they could no longer afford to subsidize the Sarnoff labs or the Bell Labs or similar kinds of institutions. Government then responded by saying "Well, we need to have something that bridges this gap that these industrial labs used to provide." There have been a number of programs designed to do just that.

The new programs have had some success, but they have also not necessarily proved politically sustainable. So that remains a serious question. You have great stuff in the national laboratories. You have wonderful basic research in the universities. How do you make sure that it makes an impact on the commercial world?

Second, on the small innovators. I think small innovators have played an important role particularly in the North American contexts. If you look at the number of patent filings in the United States, you will find a large number of small companies or inventors.

The innovative success of small business is the product of a public as well as a private system. There is public federal support for the small business innovation. Every agency in the federal government that has a major research budget has to take a certain small percentage of that money and set it aside for small businesses, who seek research support based on compelling technical and commercially viable ideas.

Many companies discovered that they could not pursue every good idea that was bubbling up inside their own labs. In some cases, they developed their own internal venture capital funds to fund their scientists and engineers with a compelling idea.

If that idea plays out, the small company may well be reacquired by Intel or someone else who has the needed manufacturing and marketing muscle. At times there is a useful symbiosis between the big and the small, not a rivalry.

DR. KING: Dave, do you have a comment?

MR. CRANE: Two things: There was a very good American economist William Baumol, and he wrote a paper recently on the innovation process, which I read, and he said what the market has decided is that there is a sort of

David and Goliath relationship. We rely on the Davids, the small companies to come forward with many of the big new ideas, and it is the role of the big companies, the Goliaths, that take these ideas, advance them, make them market friendly, market them and do all of these kinds of things.

So a successful innovation system needs both Davids and Goliaths. The problem in Canada, we have a lot of Davids; very few Goliaths, so it makes it very difficult to follow that model, but I thought that was an interesting way of putting it.

Now, there was a piece I read recently on Proctor & Gamble, which sort of showed this in a different way, and what Proctor & Gamble has is a huge R & D facility, and it used to try and get most of its technology internally.

Now their goal is to get roughly half of their new product developments from other people they work with, whether in China or India or Ohio or in Toronto or wherever, and so that they used to say we get our new products from our R & D labs. Now, they sort of say we get our new products through R & D labs, a different concept of going out and reaching out in the world and recognizing that it is much more efficient to find a whole array of people that are working on things but to set up – they have set up what you would call within their corporation an institutional framework under which they manage this.

This is why getting institutional things within a company or within a society are so very important and why – so that's what I would call an institutional innovation. That's why when we talk about innovation we have also got to talk about institutions.

DR. KING: One final question. Marty Gelfand.

MR. GELFAND: Yeah, thanks. I just wanted to get back to that social upheaval issue that Mr. Hughes mentioned from the first question. You know, I think what we see happening is that people in China and India being raised up from, you know, \$2 a day wages, which is good.

On the other hand, we see American workers going down in a lot of ways. I was just at a rally yesterday among Communication Workers of America members. They have gotten word that after the acquisition of SBC by AT&T a lot of the internet protocol jobs are being outsourced.

Of course, they want IP jobs for their members. They also want call center jobs for their members, and the vice president of the union gave a talk at this rally yesterday. And he points to all the great public institutions we have in this country: Our schools, libraries, roads, bridges were built by the taxes paid by our middle class, and as the U.S. workers' wages go down, and their jobs are outsourced, and the money is concentrated with the highest paid executives of the companies.

The taxes are not going to our roads and our schools and our bridges any more. Those bridges – and I know this – are crumbling. Our infrastructure is

crumbling, and our workers are not being paid what they were, and the jobs are being outsourced.

How do we avoid – or do you avoid the social upheaval that comes with the negative of the American worker and decent wages and middle class incomes for American workers?

DR. KING: Kent, do you want to take that?

MR. HUGHES: If you have a job that is subject to international competition, whether that happens to be a front-line worker or a highly educated chip designer, your wages are going to be under severe pressure.

There has been a triple whammy for the front line manufacturing worker. International trade very often brings in low-wage labor in the form of goods produced overseas. Modern technology frequently replaces routine jobs with machines. When you make a 411 call for information, the response is as computerized as possible. For many occupations, an essentially wide open U.S. border has put downward pressure on the wages of many Americans with traditional skills.

What's the answer? The labor movement has split, so that parts of the labor movement are now organizing people who are not easily subject to international competition. These can be workers in the building trades, janitors, healthcare workers—jobs which have to be performed can not easily be sent overseas.

For other kinds of skills we are going to have to really rethink our education system. Take an engineer: You are a young student. You are bright. You like math and science. You are thinking about computer science or maybe mechanical engineering as a major. But, you have been quoted as saying “I do not want to have to move to India to get a job. I do not want to work for \$20,000 a year.”

A good thing about our system is its flexibility. Deans of engineering are already asking: “what kind of skills can be developed that are not so easily replicated everywhere? How can we give people a career with a future?”

We run a risk, I think, that if we don't make changes, of having an already unequal income distribution that will become much more so. There will be with two clear beneficiaries—people who happen to own the right kind of capital at the right time or people that have the right skills at the right time.

We will deal with that, in part, I think by having a public commitment to a universal and portable safety net, which we do not yet have in the United States. We must improve our entire education system and make further education a life time possibility. In some cases we will turn to the tax code with policies like the earned income tax credit. If, however, you simply advocate more welfare for more people, you will find that's not a saleable proposition in the United States.

President Clinton put it simply: If you are working full-time in America, you should not be poor. Almost everybody agreed with that proposition so

the question was how to do it? Education will be part of this, but you can be highly educated and subject to this international competition so it is not the sole answer.

DR. KING: Any comments, Dave?

MR. CRANE: You know, I know you want to wind up and very quick. Everything Kent talked about hinges on our ability to sustain and improve productivity performance so that we generate the wealth to be able to support these kinds of systems.

So again that's why innovation is so important, is this contribution to productivity performance. I think in looking at the social disruption in our own countries we shouldn't overlook the fact that in China and India there is perhaps greater social disruption, and I think I read the other day that in China they have had to deal with 87,000 disturbances of people rebelling against conditions. We do not read about a lot of those because they do not happen in Shanghai.

MR. HUGHES: These were the disturbances that the Chinese Government self-reported.

MR. CRANE: Yeah.

MR. HUGHES: So it may not be all the disturbances that took place.

MR. CRANE: Yeah. The National People's Congress, which was held recently in Beijing, put a lot of emphasis on restructuring the countryside, as they put it, because that is where the roughly 800 million people are still living at very low levels, a very low standard of living.

India has terrible problems of poverty it has to deal with. It is not just upheavals here but big upheavals in these other societies as well, which threaten their social stability.

The only other thing I wanted to mention because I forgot to mention earlier, Henry, was in talking about the North American partnership for security and prosperity. Of course, there was a second summit just a week or two ago where the three leaders agreed to establish a North American Council on Competitiveness, and so we will see where that leads. That's something to watch.

I think a lot of it will be on border issues and on harmonization of standards and this kind of thing. If it is done right, it could also look at ways to have greater collaboration on solving energy and problems in the energy industry, a need for innovation and the automotive industry where there is a need for innovation, the steel industry and industries of that sort, so that's something we need to keep an eye on.

MR. HUGHES: Can I have just one more point?

DR. KING: Sure.

MR. HUGHES: We often neglect the power of the vote. Such a large number of people do not vote in this country, and those that have been most affected by globalization are also among those who tend to vote the least.

India is an interesting lesson in contrast; it is a democracy, where the very poor in India are often highly organized. I read an article recently about a group that is living illegally on land that belongs to the airport. They have elected their own representative. They are not going to be moved unless they are fully compensated.

We have allowed a kind of negligence, almost a form of alienation, I think, to creep in to our politics. If the people who are most affected by the pace of economic change were actually voicing their concern, we would be more effective in meeting it.

DR. KING: Okay. Well, it was a wonderful session and thank you very much.

DR. KING: We will take a five-minute break, and then we will move on to Government assistance towards innovation.

(Session concluded.)

